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Coalescention of water oil emulsions on the surface of PTFE grains

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Abstract

© 2018 Authors. In this work researches on division of water oil emulsions and oil-containing waste by a coalescention method on granular polymers from a polytetrafluoroethylene (PTFE) with sizes of particles of grains from 0,5 mm to 3 mm are conducted. Dynamic filtration of an emulsion was carried out through grains of polymer filled in a column with a diameter of 10 mm, the mass of grains of polymer was 2 g, and height of filling of a column of 10-12 cm. Speed of filtration of these emulsions through a column depends on the size of grains of a pol-ytetrafluoroethylene. So with increase in the size of particles the speed of filtration increases, but the efficiency of removal of oil prod-ucts decreases. Extent of cleaning of a water oil emulsion of oil products with initial concentration of 828 mg/dm3 made 62% at filtration through polymer with sizes of grains < 0,5 mm and 51% at filtration of an emulsion through polymer grains with a size more than 3 mm. The efficiency of removal of free oil products was more than 90% of waste water. On the surface of grains of polymers the coalescention and aggregation of a particle of oil products is observed. Coalescention of oil products on grains of polymer is effective at removal from the unstable and stratified emulsions.

Keywords

Coalescention, Efficiency of cleaning, Filtration speed, Oil products, Polytetrafluoroethylene, Water oil emulsion, Water-repellence

References

[1] Fazullin D.D., Mavrin, Sokolov M.P. Utilization of waste lubricat-ing-cooling fluids by membrane methods/Chemistry and Technolo-gy of fuels and Oils. 2015. Vol. 51. No 1. River 93-98

[2] Fazullin D.D., Mavrin, G. V., Shaikhiev I.G. Modified PTFE-PANI Membranes for the Recovery of Oil Products from Aqueous Oil Emulsions/Petroleum Chemistry. 2017. Vol. 57. No 2. River 165-171

[3] Fazullin, D. D., Mavrin, G. V., Nasyrov, I. A. Dynamic membranes of nylon-PTFE for separation of water-oil emulsions. Journal of Fundamental and Applied Sciences. 2017. Volume. 9 Issue. 1S. Pages: 1441-1449

[4] Sunil Lalchand Kokal. Crude Oil Emulsions: A State-Of-The-Art Review/Society of Petroleum Engineers. 2005. Vol. 20. No 1. River 93-98

[5] Isaacs E.E., Huang H., Babchin A.J., Chow R.S. Electroacoustic method for monitoring the coalescence of water-in-oil emul-sions/Colloids and Surfaces. 1990. Vol. 46. No. 2. P. 177-192

[6] Tetsuji Hirato, Kazuya Koyama, Takahiro Tanaka, Yasuhiro Awakura. Hiroshi Majima Demulsification of Water-in-Oil Emul-sion by an Electrostatic Coalescence Method/Materials Transac-tions. 1991. Vol. 32. No. 3. P. 257-263

[7] Soumitra Maiti, Mishra I.M., Bhattacharya S.D., Joshi J.K. Remov-al of oil from oil-in-water emulsion using a packed bed of commer-cial resin/Colloids and Surfaces A: Physicochemical and Engineer-ing Aspects. 2011. Vol. 389. No. 1-3. P. 291-298

[8] Stalemate. 124672 Russian Federation, MPK C02F1/00 Sewage treatment unit and technological liquids / Fazullin D.D., Mavrin, Nasyrov I.A.-2012118948/05; zayavl. 05.05.2012; opubl. 10.02.2013

[9] Paixao M.V.G., Balaban R.D., Application of guar gum in brine clarification and oily water treatment/International journal of bio-logical macromolecules. 2018. Vol. 108. River 119-126

[10] Wang Shuo, Qin Wei, Dai Youyuan. Separation of Oil Phase from Dilute Oil/Water Emulsion in Confined Space Apparatus. Chinese journal of chemical engineering. 2012. Vol. 20. Issue. 2. River 239-245

[11] Xiao Chen, Houfang Lu, Wei Jiang. De-emulsification of Kero-sene/Water Emulsions with Plate-Type Microchannels. Industrial & engineering chemistry research. 2010. Vol. 49. Issue. 19. P. 9279-9288

[12] Fazullin D. D., Mavrin G. V. Coalescence of water-oil emulsions on thin-layered PVC plates/Turkish online journal of design art and communication. 2017 Vol. 7. P. 1686-1692

[13] Shatilova L.M., Borisova V.V., Kasatkina O.A. (2018). Represen-tation of the linguistic and cultural concept "lie" in the French and Russian language picture of the world, 34(85), Pp. 194-212

[14] Bakhyt S., Kalimbetov B., Khabibullayev Z. (2018). Possibilities of Mathematical Problems in Logical Thinking, Development of Secondary Education Pupils, 34(85), P.p. 321-338

[15] Jingquan Li, Yongan Gu. Coalescence of oil-in-water emulsions in fibrous and granular beds/Separation and Purification Technology. 2005. Vol. 42. No 1. P. 1-13

[16] Swarna Bansal and others. Effect of fibrous filter properties on the oil-in-water-emulsion separation and filtration performance/Journal of Hazardous Materials. 2011. Vol. 190. No 1-3. P. 45-50

[17] Adelshin A. B. Intensification of processes of hydrodynamic purifi-cation of oil-containing sewage: Tech. Sci. PhD: 05.23.04. / Ad-elshin Azat Bilyalovich. SPb., 1998. 74 pages

[18] Vu Van TUAN-Communicative Competence of the Fourth Year College Students: Basis for proposed English Language Program, Astra Salvensis, Supplement No. 2, 2017, p. 45

[19] [1] Irina MALGANOVA, Andrey ERMAKOV, Development of heating Devices from Polypropylene, Astra Salvensis, Supplement No. 2, 2017, p. 93